CSE 259 - Logic in Computer Science (Spring 2024)

Recitation-1

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Slides and Codes

- Slides and codes will be available in the Github repository - https://github.com/Waqar-107/ASU-CSE-259-Prolog

How to contact with me

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- Discord handle: Waqar_107

I check both frequently!

Prolog - resources

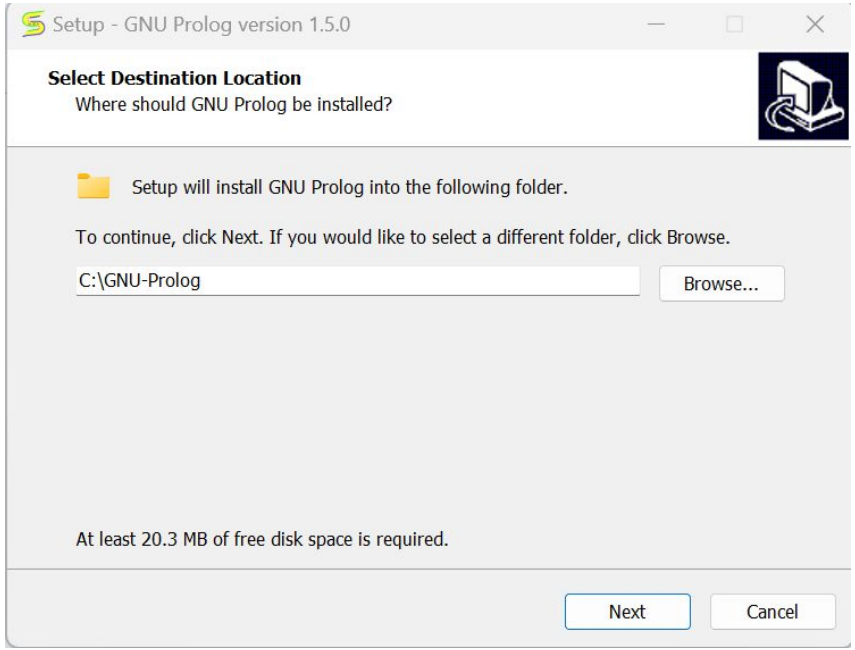
Tool we will be using:

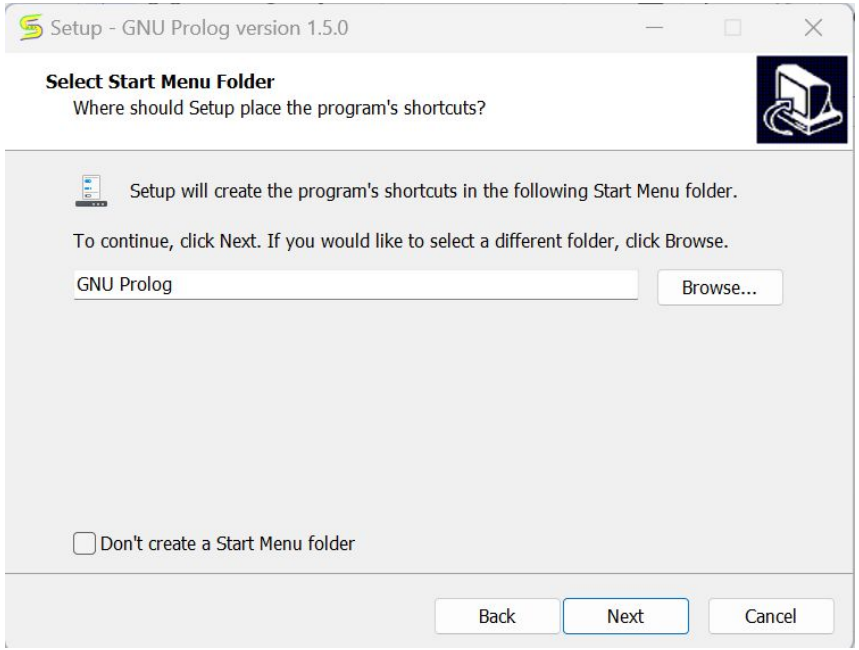
- GNU Prolog

Useful resources:

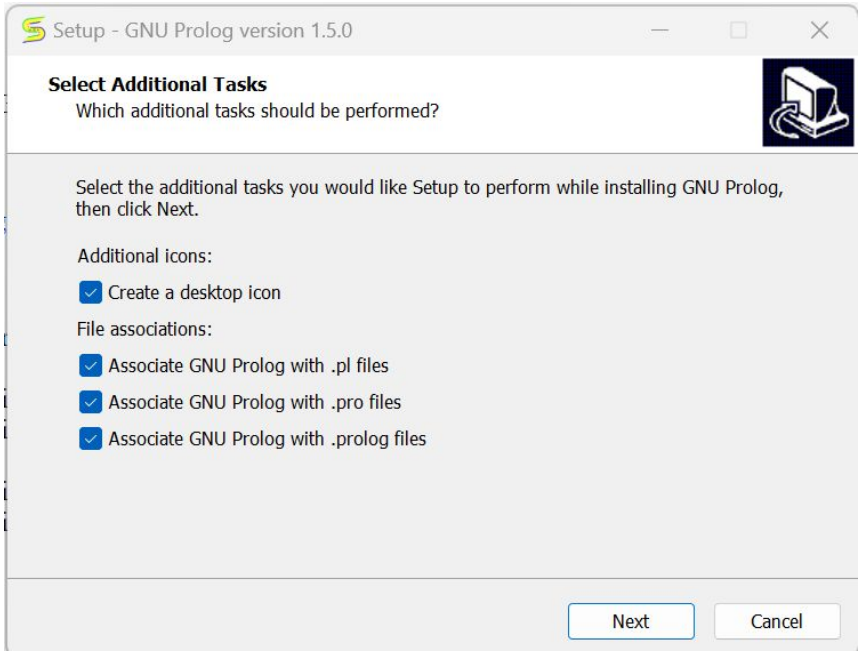
- GNU Prolog manual
- The Prolog Dictionary
- Prolog Tutorial - TutorialsPoint
- Prolog Tutorial from YouTube

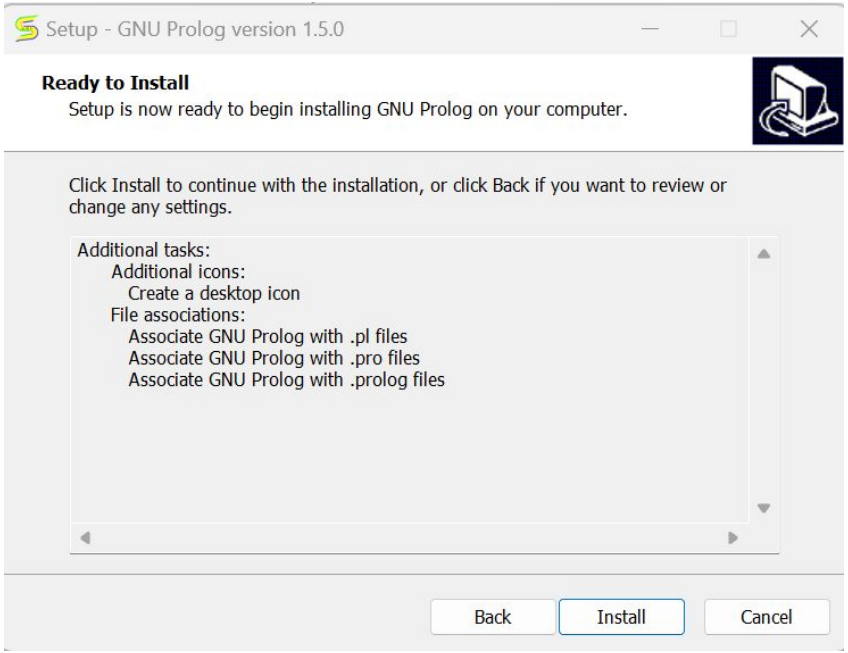
Installation - Windows





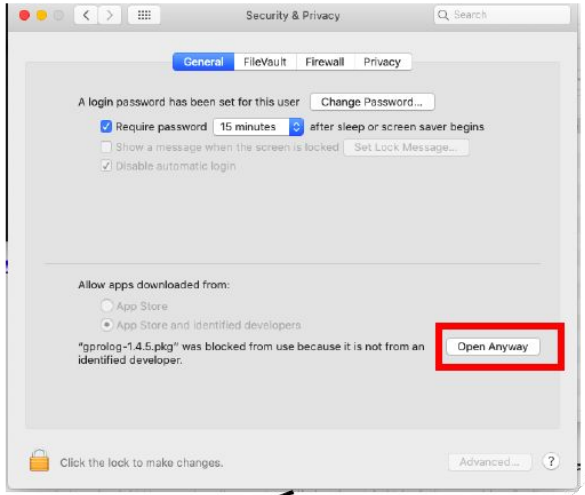
Installation - Windows contd.

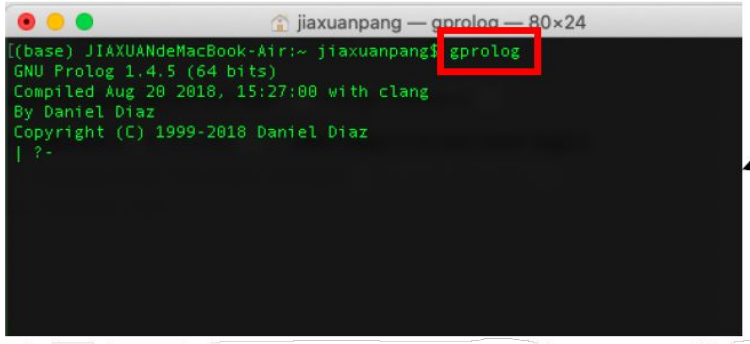




Installation - Windows contd.

Installation - MACOS





What is Prolog?

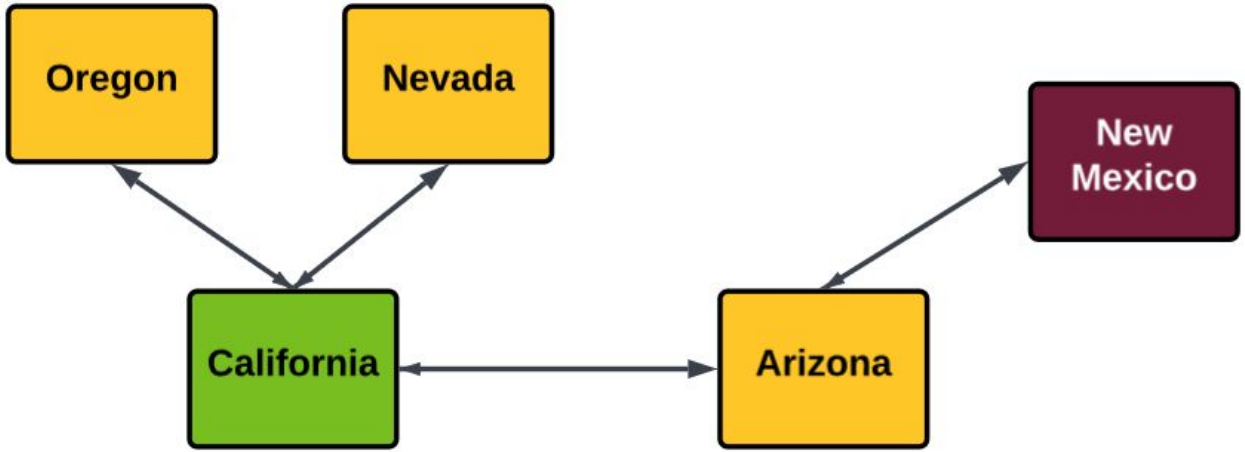
- Prolog is a **logic programming language**
- Prolog is intended primarily as a **declarative programming language**

Declarative Programming Language

Declarative programming is when you write your code in such a way that it describes what you want to do, and not how you want to do it. It is left up to the compiler to figure out the how.

Example: SQL, Prolog (Obviously :D)

An example



Suppose, we are in California. Which states can we visit from here? (We can travel if the states are adjacent)

Sample code for the example - Java

```java
public class StateTravel {

    public static void main(String[] args) {
        boolean oregonConnected = true;
        boolean nevadaConnected = true;
        boolean arizonaConnected = true;
        boolean newMexicoConnected = false; // Arizona only connects to New Mexico

        // Individual if cases for each state
        if (oregonConnected) {
            System.out.println("Can travel to Oregon from California.");
        } else {
            System.out.println("Cannot travel to Oregon from California.");
        }

        if (nevadaConnected) {
            System.out.println("Can travel to Nevada from California.");
        } else {
            System.out.println("Cannot travel to Nevada from California.");
        }

        if (arizonaConnected) {
            System.out.println("Can travel to Arizona from California.");
        } else {
            System.out.println("Cannot travel to Arizona from California.");
        }

        if (arizonaConnected && newMexicoConnected) {
            System.out.println("Can travel to New Mexico from California (via Arizona).");
        } else {
            System.out.println("Cannot travel to New Mexico from California.");
        }
    }
}
```

Sample code for the example - Prolog

```
1     next_to(oregon, california).
2     next_to(california, oregon).
3
4     next_to(california, nevada).
5     next_to(nevada, california).
6
7     next_to(california, arizona).
8     next_to(arizona, california).
9
10    next_to(arizona, new_mexico).
11    next_to(new_mexico, arizona).
12
13    travel(A, C) :- (next_to(A, C) ; (next_to(A, B), next_to(B, C), A \= C)).
```